

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a Group III nitride semiconductor layer; and

a gate electrode formed on the Group III nitride semiconductor layer,

5 the gate electrode containing an adhesion enhancing element,

a thermally oxidized insulating film being interposed between the Group III nitride semiconductor layer and the gate electrode.

2. The semiconductor device of claim 1, wherein the thermally oxidized insulating film is composed of an aluminum oxide or a silicon oxide.

10 3. The semiconductor device of claim 1, wherein the thermally oxidized insulating film has a thickness not less than 0.5 nm and not more than 3 nm.

4. The semiconductor device of claim 1, wherein the gate electrode contains Pd.

5. The semiconductor device of claim 1, wherein the adhesion enhancing element is a highly oxidizable element.

15 6. The semiconductor device of claim 1, wherein the adhesion enhancing element is Ti, Ni, or Si.

7. The semiconductor device of claim 1, wherein the thermally oxidized insulating film is an insulating film obtained by thermally oxidizing the Group III nitride semiconductor layer.

20 8. The semiconductor device of claim 7, wherein the adhesion enhancing element is Si and a weight percent of the Si in metals composing the gate electrode is not less than 3% and not more than 10%.

9. The semiconductor device of claim 7, wherein the adhesion enhancing element is Si and a weight percent of the Si in metals composing the gate electrode is not less than
25 4% and not more than 7%.

10. A method for fabricating a semiconductor device, the method comprising the steps of:

thermally oxidizing a Group III nitride semiconductor layer to form a thermally oxidized insulating film on a surface of the Group III nitride semiconductor layer; and

5 forming a gate electrode containing an adhesion enhancing element on the thermally oxidized insulating film.

11. The method of claim 10, wherein the step of forming the thermally oxidized insulating film includes the step of:

forming an aluminum nitride layer on the Group III nitride semiconductor layer
10 and then thermally oxidizing the aluminum nitride layer to change the aluminum nitride layer into an aluminum oxide layer and thereby form the thermally oxidized insulating film composed of the aluminum oxide layer.

12. The method of claim 11, wherein the aluminum oxide layer has a thickness not less than 0.5 nm and not more than 3 nm.

15 13. The method of claim 10, wherein the step of forming the thermally oxidized insulating film includes the step of:

forming a silicon layer on the surface of the Group III nitride semiconductor layer and then thermally oxidizing the silicon layer to change the silicon layer into a silicon oxide layer and thereby form the thermally oxidized insulating film composed of the
20 silicon oxide layer.

14. The method of claim 13, wherein the silicon oxide layer has a thickness not less than 0.5 nm and not more than 3 nm.